

# **Rockwell lBeacon**

User  
manual  
v2.04

1Slon Ltd.

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## Appointment the radio searching system.

Radio search system Rockwell lBeacon designed to search for people, animals, machinery or materials, which were be pre-installed beacons of this system. Very long range - up to 8 km\* , and long time work beacon from one battery - up to 2 years good distinguish the search system from other similar products.

To work Rockwell lBeacon system does not require a cellular, SIM cards, payed service and so on. You may using the beacons: on the ground as well as underground

parking lots, garages, shopping malls, basements and attics, ie there any GPS trackers do not work.

*\* (with the line of sight and the directional antenna. )*

Principle searching beacon, who mounted on the object (collar, clothing) is to assess the level of radio signal (in percent) observed on the display on the search device.

## **Principle of operation.**

The system Rockwell IBeacon is built on the principle of two-way digital radio communication. For maximum battery life of the beacon it is stay in "sleep" mode (maximum save battery energy), and go "wake up" mode by 0.05 seconds for the control of air every 10 seconds. If in “wake-up” mode the beacon will hear a request searching device with its serial number it will send acknowledge, and returning to "sleep " mode will be delayed for 1 minute.

When the beacon breaking receives requests from the searcher device, it will be 1 minute stay in "work" mode continuously monitoring the air, after this time go to "sleep" mode (with "wake up" mode every 10 second).

The searching device continuously sends requests a specific beacon and the beacon responding to the request, what contains a unique serial number. According to answer the searcher on the display shows the signal strength as a percentage of the beacon.

This is true for all modes except "relay" mode .

## Product selector.

Radio search system Rockwell IBeacon is may be equipped with various types of beacons (LongLife, Light, Mini and Sens), the differences you see in the table and below:

Radiobeacon IBeacon Light has very low weight -only 3 gram! This ideal for microUAV and flying model, who has onboard voltage for power beacon (3-12 v.).

Radiobeacon IBeacon Sens has a built-in accelerometer, you can use it for the anti-theft protection of various objects. When you move the beacon in the searching device sounds an alarm. Also this beacon has input for connect external GPS receiver/ OSD system or NAZA controller and send coordinates to searcher device. Excellent for DJI Naza-M Lite/Naza-M v2/Phantom 2 UAV.

Radiobeacon IBeacon Mini has input for connect external GPS receiver/ OSD system or NAZA controller and send coordinates to searcher device. Optimum for price/functional. Good to search lost pets.

Radiobeacon IBeacon Long Life has very long time work time-up to 2 year! (Is powered by 2 x AAA alkaline batteries) Its ideal for car, motorbike, bicycle, boat.

IBeacon option	Sens	Mini
Find beacon from searcher device	Yes	Yes
Work with "repeater" mode	Yes	Yes

"Alarm" mode with motion sensor	Yes	No
The ability to connect the GPS receiver	Yes	Yes
Continuous operation from one battery	Up to 2 month	Up to 2 month
Type of battery	Built-in rechargeable battery by miniUSB	Built-in rechargeable battery by miniUSB
Weight, gram	12	12
Dimension, mm	43 * 22 * 8	43 * 22 * 8

## **The main features of the system.**

- Search beacons at a distance up to 8 km\* with the help by monitoring the signal strength of the beacon on the digital display searcher. (in percentage from 0 to 100)
- Duration of continuous operation with long-range and power-efficient digital beacons: lBeacon Sens and Mini- up to 2 months on internal battery, lBeacon Long Life- up to 2 year on 2\*AAA battery
- View the last known coordinates of the beacon on the digital display searcher, when you connect an external GPS receive / OSD system or NAZA controller to the beacon Mini or Sens . Stored (and send) last known coordinates unlimited time. (Only beacon Sens and Mini).
- Compatible with NAZA Lite, NAZA M v1, NAZA M v2 and PHANTOM 2 - easy connection beacons to quadrocopter for search, observation coordinates and flight parameters (speed, altitude, etc.) in real time
- Automatic recognition type of the connected GPS receiver and its baud rate. (Only beacon Sens and Mini)
- Beacon Sens and Mini have built-in LiPo battery, charging from computer USB port (connector miniUSB) or another external charger. The charging indicator light .
- Improved whip antenna may be determine the direction of the beacon (only in the absence of reflected signals). If necessary, to the searching device can connect directional antenna (not included in delivery), with increases in the range of 2.5 - 3.5 times.
- Transfer the coordinates of the beacon in real time on a computer or smartphone via Bluetooth device search for observation on the map (imitation wireless GPS receiver, protocol NMEA 0183) (work only when beacon Sens or Mini be connected external GPS receiver / OSD system or NAZA controller).

- Indication of battery voltage beacons and the searcher on the display.
- To the IBeacon Sens - "Alarm" mode with motion sensor. Filing alarms searcher when moving or tilting the RF beacon. Automatic control of communication.
- Built-in LiPo battery to the searcher, charging from computer USB port (connector miniUSB). Charging indicator. (Only beacon Sens and Mini)
- Management of the searching device with the Android smartphone or Android tablet. Changing setting the beacon(for advanced users). Via a special program.
- You can use one of the beacon as a repeater to significantly increase the range of the search or display of coordinates. The repeater may be installed on a UAV (Unmanned Flying Vehicle).
- Heavy duty metal housing searcher with solid protective glass on the display.
- The searcher is able to work with all beacons previous one family of digital beacons ROCKWELL PELENG.

## **Package content.**

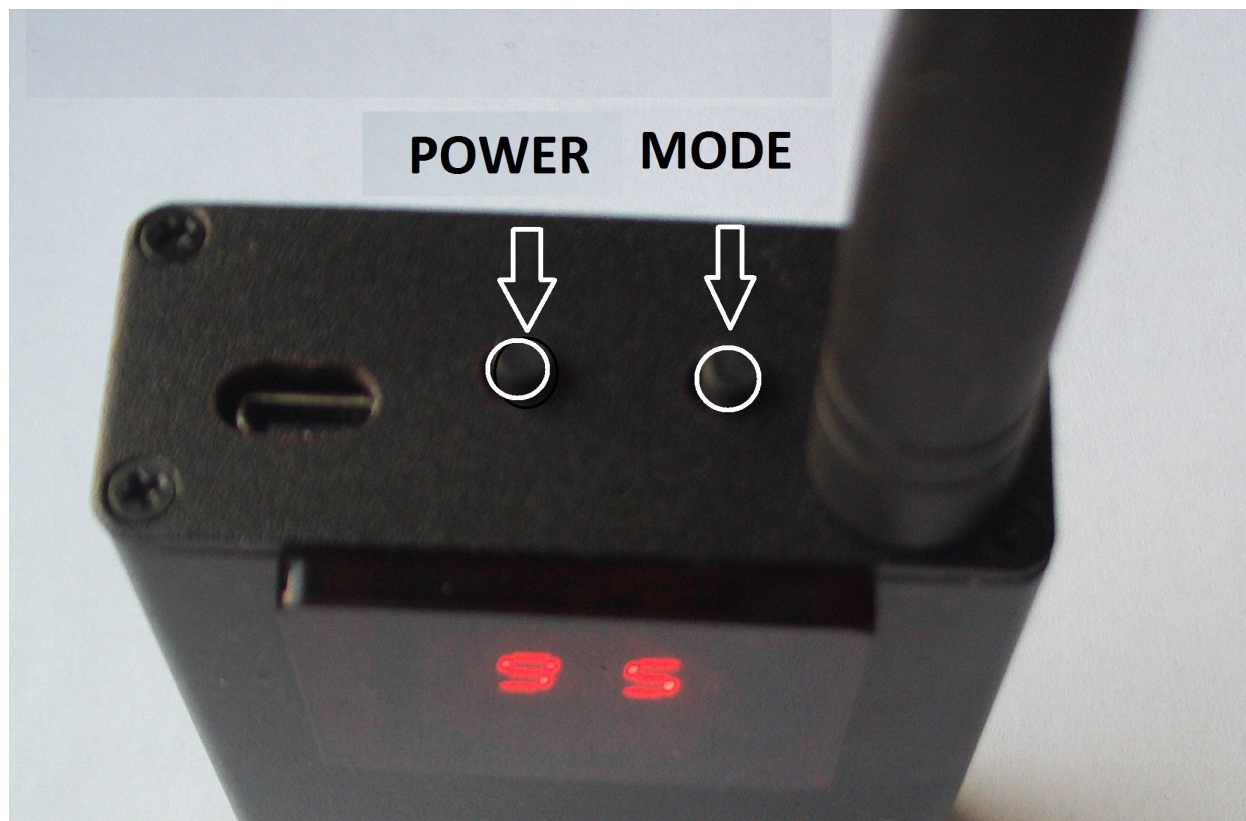
Package system includes the following components:

- one beacon
- searcher device
- detachable whip antenna for the searching device
- short version of this manual

Optional you can buy:

- Additional beacons
- mini USB cable for charging
- directional antenna for the searching device
- cable to connect an external GPS receiver
- Tablet PC or phone with Android OS

## Controls and indicators.



On the searcher located:

top - miniUSB connector for charging the battery, button POWER, button MODE, antenna connector SMA-type,  
front - under durable protective glass two-digit super bright LED display and charging LED.

At the beacon Sens and Mini - miniUSB connector for charging and connecting an external GPS, two LEDs - (the indicator of work and control charging) and antenna length approx. of 75 mm. This beacon NOT have power switch, it will be always power-on.

At the beacon Long Life – power switch, antenna. Indicator LED located in hole for antenna.

Indicator LED for normal use flash 1 time per 10 second. When beacon have request searching device this the led flash quickly.

The charging LED light when battery charging. When battery full charge - this the LED will be off.

## **Power on and find the beacon.**

To enable the searching device, press and hold the POWER button until the turn on the display. The first 3 seconds, the display shows the battery voltage in tenths of volts, for example "32" means that the battery is normally charged, the voltage is 3.2 volts or more. Higher than the 3.2 volt voltage is measured and displayed. Voltage "31" refers to the need for a quick charge the internal battery, and the voltage at the "30" battery requires charging.

Further, the display shows the operating mode and the number of the current beacon, which asks for the moment the searching device. In normal mode, the beacon search directly on the display should be "n + number", eg "n0". Number - the number of beacon in memory in the searching device.

For example, "n0" - normal search beacon number 0 ("n1" - beacon number 1, etc.)

When the beacon answer requests a searching device, display will change to a percentage of the signal:

"00" — beacon is online, the signal level 100%

"99" - beacon is online, the signal level of 99%

.....

"10" - beacon is online , the signal level of 10%, etc.

If the beacon in the process of answering lost connection with (which is quite possible at a low level signal), the level indicator will change back to the original ("n0")

Selecting another beacon to find (among the stored in a searching device) is made by briefly pressing the POWER, then change the number of beacons memory on the display.

To turn off the search device, press and hold the POWER button for about 4 seconds before the display goes out.

## **Additional function.**

### **Charging beacon and searching device.**



**Warning!** Before using beacons and searching device should be charged, they come from the factory with a small charge batteries! Nominal charging voltage (on USB connector) of 5 volts, exceeding its over 5.5 volts is strictly not allowed.

Various beacons have different work times on a single charge (or one set of batteries). For example, in standby mode (this is the main mode of operation of the beacon) beacons Sens and Mini working up to 2 months without recharging, and the beacon LongLife - up to 2 years. In the phase of active search (when the beacon responding searcher) beacons Sens and Mini worked for 4 hours continuously, and LongLife to 24 hour. In the “Alarm” mode beacon Sens will run for two weeks continuously. On the life of the great influence: humidity, temperature and the presence of interference.

The searching device runs on a single charge for about 15 hours, in the “Alarm” mode - to one day.

In order to charge beacons Sens, Mini or searching device you can use any suitable cord with plug mini-USB. You can charge both the port on the computer or car charging. The red LED will indicate the charging process has started, after it goes out. beacon LongLife does not require charging and is powered by 2 x AAA batteries, which must be replaced during the discharge.



**Warning!** Beacon Sens (and Mini) does not have a power switch, and if you forget, or not be able to charge it in a timely manner, then the full charge of the battery (after about 2 months of standby time) beacon completely off automatically. For its reverse inclusion of this mode, you need at least the first hour of charging produce computer USB port. The same is true for the searching device. Charge the searching device from the USB port of the computer if it starts charging the usual clicking the speaker.

This feature is charging from a USB port is thus that the beacon is held in the reset state, is not functioning and only comes into operation when disconnecting the cable. Charging the same from the charger or external 5 V does not reset the beacon.

When connecting an external power source to charge the beacon first 20-30 seconds begins to look for the source of GPS data. If it finds one, the beacon starts to process the coordinates. If during this time, the source of GPS data is not found, the beacon returns to normal operation ("Sleep" mode) and the next search the GPS receiver will begin only after disconnecting the external power supply for at least 1 minute and feed it again.

### **Recording new beacon into searching device.**



**Warning!** To begin, prepare a place - to make a recording you must remove the searcher at least 2 meters from ANY beacon system IBeacon.

- Turn off the searcher.
- Press and hold down both button the searching device, until the indication of supply voltage does change to "b-".
- Now release the button. Display will change to "PP" . Wait 5 seconds (until the lights "PP").
- After 5 seconds the display will change from "PP" on «bd» ("bind").
- Now, if you bring a beacon IBeacon to the searching device (5-10 cm), it will register it in memory (for 10-15 seconds), as reported on the display the inscription «P1» or «E1» (or another number ). The display will change to "P1" or numbers that will show you the number of the beacon in memory. If the beacon is already registered in this searching device, the display "E1" (or another number), which says that the beacon is already in the cell with this number.
- After this message, you need to remove the beacon at a distance of at least 2 meters from the search engine and, if necessary, to bring next. Total possible to record up to

5 beacons. When recording 6th it is written on the beacon location 0th, recording 7th to 1-st place and so on.

To exit the record - by pressing «POWER» when the display shows «bd». Then you MUST turn off the searching device and turn it on again. Check the operation of all recorded beacons.

### **Clear memory searching device.**

For clear the memory searcher turn it on while holding both buttons. Continue holding both buttons until the display shows "CL", then release only the button «POWER».



**Warning!** Be careful on the next steps you have only 2 seconds!

When the display shows «C0» release the button MODE, the display will change to «C1» - immediately press the MODE button and hold it until the «C2». Then, the display changes to "C8"., This means that the all beacon is now removed from a searching device. Now you can release the button.

If you make a mistake at some stage or erase operation, the searching device will return to normal operation.

### **"ALARM" mode beacon Sens.**

Beacon Sens has built-in accelerometer that can be used for protection of various objects (luggage, bicycles, motorcycles, etc.). If system put in «ALARM» mode, moving (and inclination) beacon fixed, sending alarm signal, and the searching device will emit an intermittent alarm. Enter in «ALARM» mode takes about 20 seconds.

To switch to «ALARM», do the following:

Power on searching device, select the you beacon Sens and you must wait for his answer. Then press and hold both buttons until the screen displays "0A" and the sound OK (low tone).

The display turns off, the beacon and the searching device will go armed. If you hear a high-pitched sound and display "OE", the «ALARM» mode enter failed. Possible causes - have chosen the beacon there is an accelerometer (beacons Mini, Light, LongLife) or no beacon in "online".

If all ok, you will see intermittent indication "A0" - «ALARM» mode, the beacon "online"

Now beacon periodic sending (every 30 seconds), whereby searcher always knows whether the beacon "online". Dropouts beacon affect high-pitched beep and display "-A" - «ALARM» mode, but is no connection to the beacon.

Reentry of communication will be shown a low-pitched sound and display "A0".

If the beacon change its position will be moved or tilted, the searching device first two minutes will emit warning signals continuously, and then switches to the reminder, uttering a short beep 1 time per 20 seconds. Display all this time is «0F» Reset the alarm (and reminders) by briefly pressing the MODE, the display will return to "A0" Exit protection - simultaneously pressing both buttons. Display will change to the usual "n0".



**Warning!** When exit «ALARM» mode, be sure to wait for the beep and display the signal strength on the searching device (response beacon), only then will exit the beacon guards. This may take up to 15-20 seconds.

### **How you can see last known beacon coordinates.**

Short press the MODE button launches a single cycle of viewing the last known beacon coordinates. Will be shown - Latitude (after the letters «LA»), longitude (after the letters «Ln»), the searcher supply voltage (after the letters «bl»), beacon voltage (after the letters «bb»). View the data can be, even if the beacon is currently not connected. Upon completion of the searching device will return to normal search beacon. Interrupt output coordinates at any time by pressing POWER.

## **Repeater.**

First you need one, you have chosen the beacon allowed to work in the mode of the repeater. Via Bluetooth, set the register 0 of the beacon at 00001. (see how to do it. In the "Appendix") When requesting such a beacon between the digits on the display will light point.



**Warning!** Remember, the system can be only one repeater, otherwise the function will not work!

When you need to find the missing beacon via repeater, do the following step:

- Enable the searching device.
- Select beacon repeater and wake him up.
- Now select the number of beacon to be searched and long pressing the MODE button, activate a repeater mode.
- Now the searcher device will show how strength signal repeater receive finding beacon.

To exit the relay again for a long time hold MODE or simply turn off the searching device, with a minute off and repeater. The same happens if the connection between the repeater and the searching device will be lost for more than a minute.

### **How to connect GPS receiver (OSD, DJI NAZA, ets... ).**

When you install the beacon on board unmanned or remotely piloted aircraft to broadcast current geographic coordinates to the ground and store them in a beacon for further search you can use an external GPS receiver, both independently and is part of a

set or OSD or autopilot. For example - the autopilot Smalltim (Swift AI), autopilot Eagle, copter DJI NAZA-M LITE / NAZA-M v2 / PHANTOM2. The beacon is connected in parallel and in no way interfere with the autopilot or OSD.



**Warning!** The beacon can not provide a GPS receiver power!

To the beacon Mini and the Sens versions can be connected to an external GPS receiver (with external power supply!) Through the mini USB connector on the board of the beacon. Requirements for GPS receiver modest - Interface UART, level of 3.3 volts, any speed from 9600 to 115200 bits / sec, the protocol NMEA0183. These requirements are satisfied 95% of all GPS units on the market, it is highly recommended to get acquainted with the specification for the module before his purchase.

Examples of such modules - Ublox 5, Ublox6, VK16E chipset Sirf3 and others. So, instead of an external GPS on this connector can be fed data from the flight controller **DJI NAZA M Lite, NAZA M v1, NAZA M v2, PHANTOM 2**. From his current position will be obtained. Please note that the GPS receiver Naza before to capture satellites can send a completely arbitrary coordinates!

The beacon will search for connected GPS receiver when applying it to +5 volts (charging), the employee including the built-in battery to charge what tells rhythmically flashing LEDs.

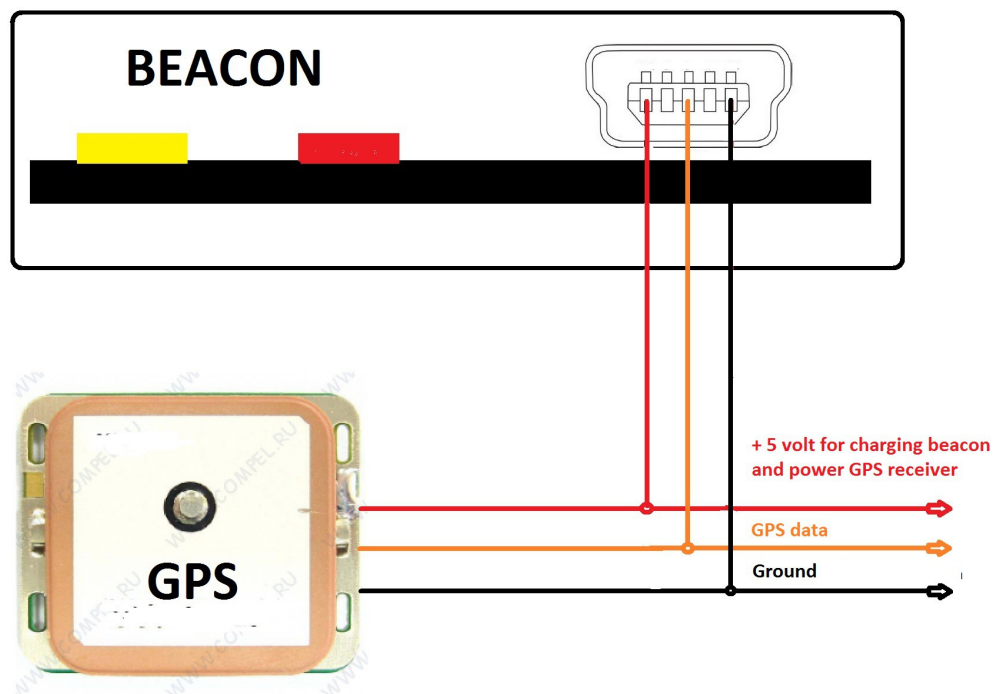
If, within 20 seconds after the connect charging power data from the GPS will be found, will automatically adjust to the speed and type of GPS (LED flashes longer flashes). Now beacon be in “WAKE UP” mode with received and memorized coordinates, but no transmission . Beacon send last known coordinates only when have request searching devices.

Otherwise, the beacon will go into normal operation (“SLEEP” mode) and following the GPS receiver will search only after disconnecting the external power supply for a period of not less than a minute and feed it again.

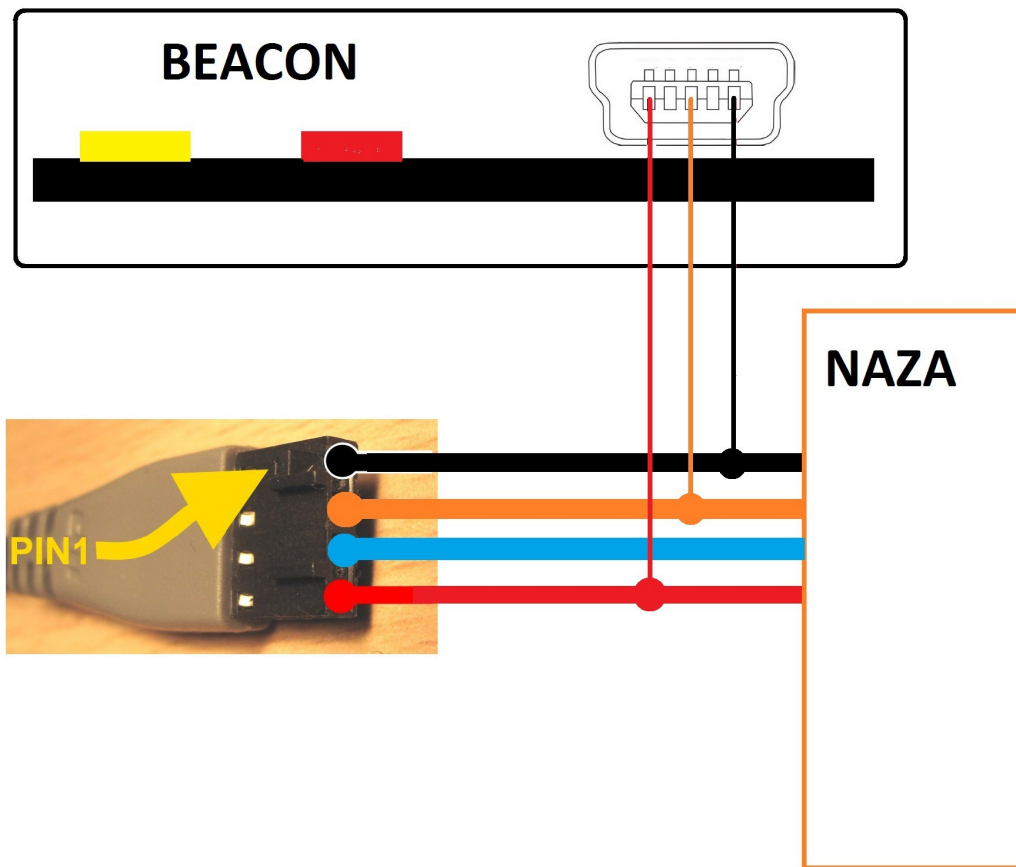


**Warning!** Mini USB jack is shown as it can be seen from the end of the eye of the beacon. External power supply voltage of 5.5 volts over categorically not allowed!

Wiring diagrams:



And wiring diagram for connect to DJI NAZA



### **Bluetooth interface.**

Significantly enhance searching complex IBeacon possible using the phone or tablet running on Android OS and equipped with a Bluetooth module.

For this same IBeacon provided Bluetooth interface. Via Bluetooth, you will be available:

- view geographical coordinates beacon
- viewing position of the beacon on the area map
- edit the settings of the beacon
- Viewing force signals from the beacon group (up to 5 unit) at the same time
- display products group beacons (up to 5 unit) at the same time on a map in real time (\* software currently in development)

A more detailed description of the functions and work with Bluetooth you can see in the appendix.

### **Mode of operation with several beacons simultaneously.**

You can view the signal strength of the group of all stored in searching device beacons entering Bluetooth commands \$ 31 \* - "GROUP" mode.

After that, the searching device will issue on screen Android application ("Bluetooth SPP") line of the text, what containing 5 values - RSSI (Received Signal Strength), 5 voltages battery beacons and level of noise at the receiver (in the searching device).

Exit "GROUP" mode command \$ 30 \*

In the future we plan to release an application for Android, which can be observed at the same time the position of up to 5 beacons on the area map.

## Characteristics.

The range of possible search is primarily determined by the conditions of propagation of radio waves through the local barriers and the level of radio interference:

- on with the line of sight and the directional antenna approx. 8 km.
- on open area approx. 2.5 km.
- in city 800-1400 meter, completely through 1-2 the multi-storey building

The working frequency band of the device - 868 MHz (915 MHz special USA version)

Working temperature -20 +40 C

Output RF power - 25 mW (up to 100 mW for some country).

Current consumption searcher from computer USB port - up to 130 mA

Current consumption of the beacon, the average "sleep" mode - 40 microampere

Work time searcher in the "Alarm" mode - up to 3 days

Work time searcher in the "Beacon" mode - up to 8 hours

Beacon Sens and Mini dimension 43 \* 22 \* 8 mm, weight 12 grams (with built-in rechargeable battery).

Work time beacon in the "Beacon" mode - up to 2 months

Work time beacon in "Alarm" mode - up to 14 days

Beacon Long Life dimension 35 \* 64 \* 15 mm and weighs 21 grams (without batteries).

Work time this beacon - up to 2 years (2\*AAA alkaline battery)

Beacon Light dimension 25 \* 20 \* 5 mm and weighs 3 grams.

Unlimited work time from external power supply 3.0 - 12.6 volt, 0.12 amp max.

Searcher device dimension 90 \* 50 \* 25 mm (without antenna) and 90 g weight.

All dimension without any connector and antenna.

- **Appendix 1. Setting Bluetooth, connect to search system, view location beacon on the map on the screen Android, change beacon setting.**

Searching device lBeacon has Bluetooth module.

Via Bluetooth you can use option on the screen Android device:

- view coordinates beacon
- view location beacon on the map
- change beacon setting
- view signal strength group beacon (up to 5 mtr) simultaneously
- view location beacons (up to 5 simultaneously ) on the map in real time (\*software be in future)

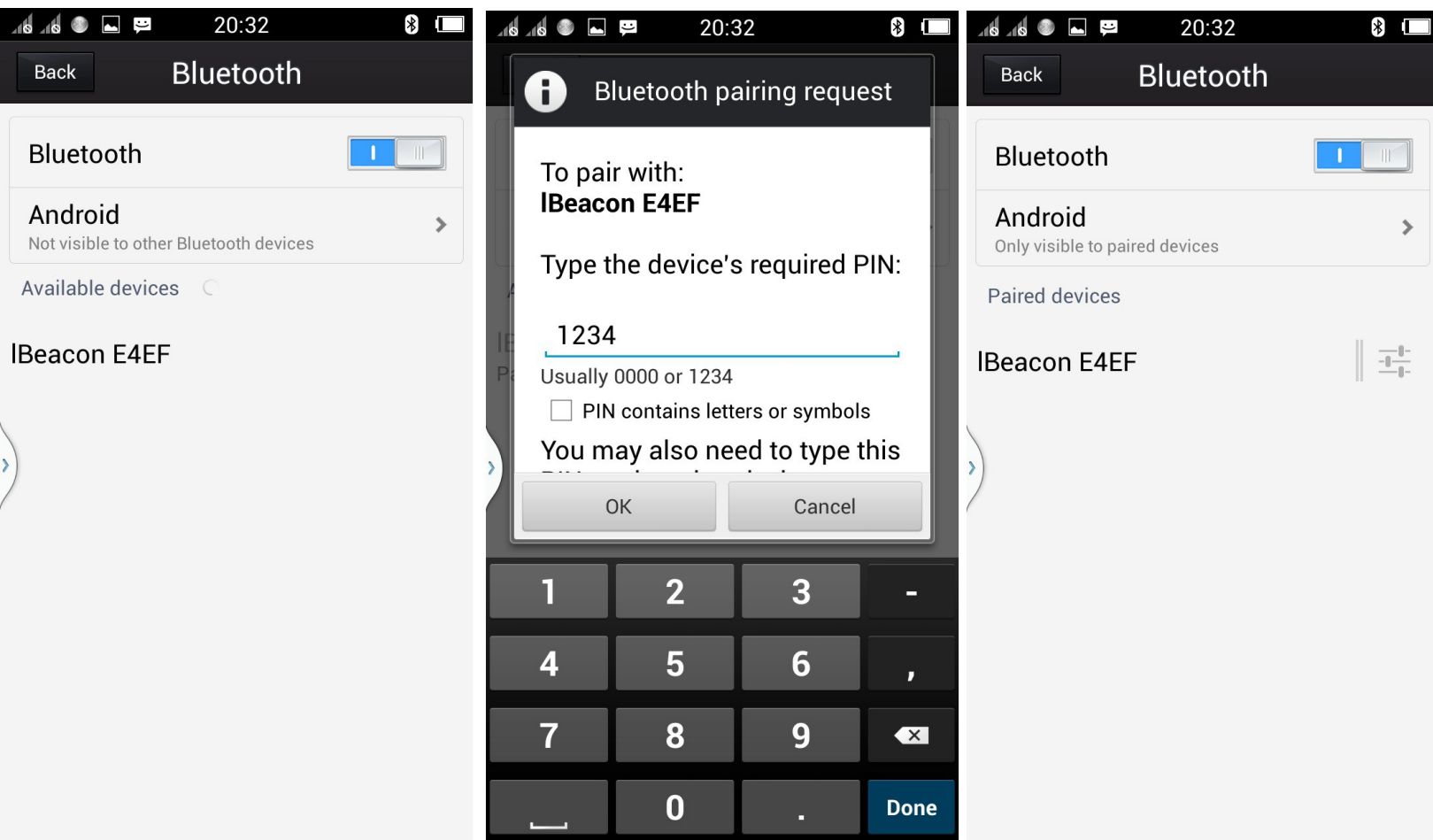
### **Connect via Bluetooth**

After power on searcher device lBeacon seen any external gadget as at Bluetooth GPS receiver continuously every 1 second outstanding NMEA message \$ GPGGA, containing the geographical coordinates of the beacon. The device name is either «HC-05" or «lBeacon-XXXX" (depending on the version of BT-module), pairing code 1234. Just add a device to your phone / tablet / laptop, just as you add any other Bluetooth device .

How to, example on the Android v 4.2.2 phone:

- power on searcher device lBeacon
- turn on Bluetooth in the Android
- search new Bluetooth device
- you searching device has name is either «HC-05" or «lBeacon-XXXX"
- tap the screen and select this device for connect, with code 1234
  - adding you device will be success
  -





### **Using the software the “Bluetooth GPS» to display beacon position on the map..**

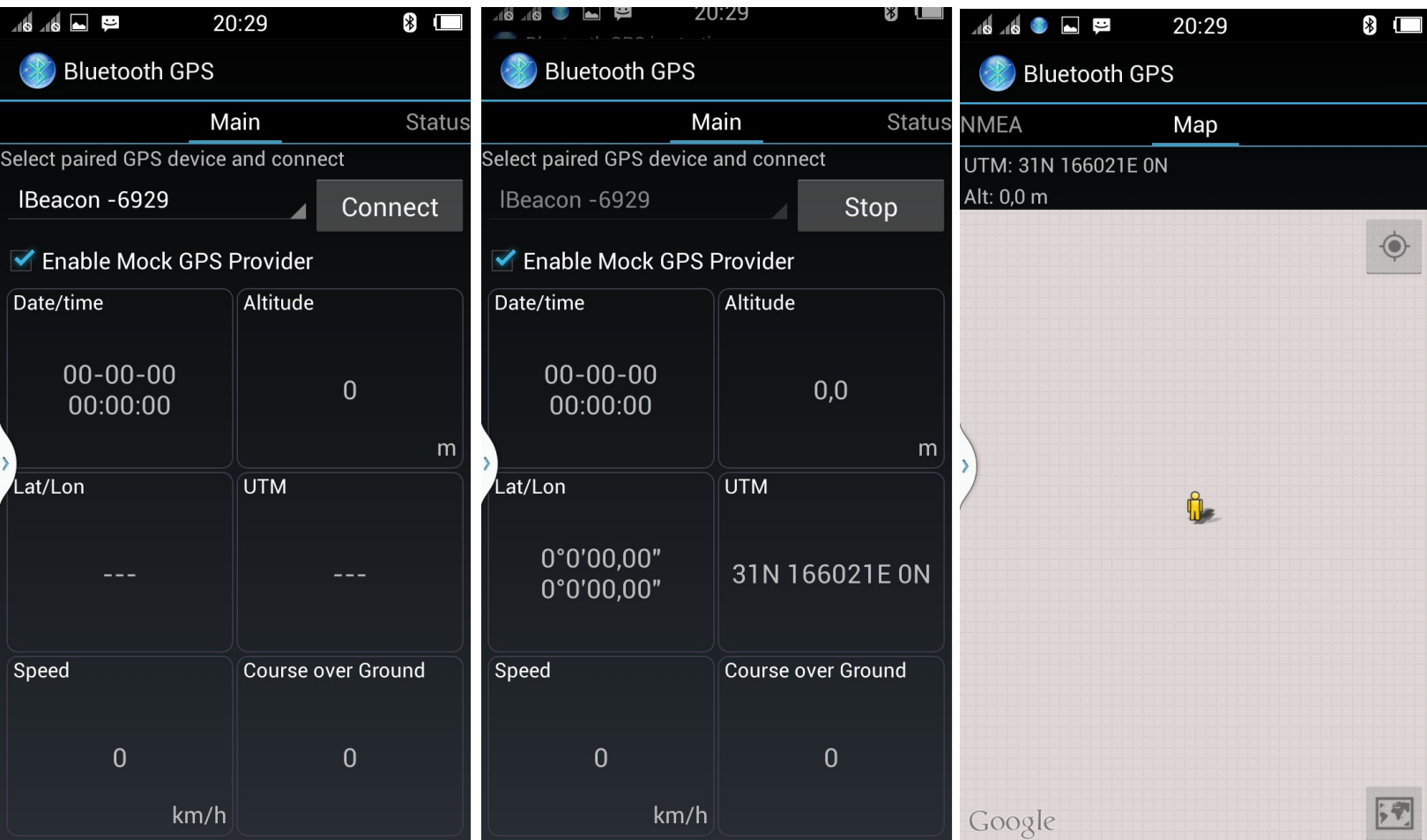
To observe the coordinates of the beacon in real time and view the last known coordinates (unless, of course, the beacon was connected to a GPS receiver), you can use software the “Bluetooth GPS». Download it from Google Play and install according to instructions. Read it carefully and follow the advice if necessary software developer, this is important.

How to use this program?

- Choose from a list of available Bluetooth devices, your searching device IBeacon (in this case the name «HC-05”)
- Check the box "Enable Mock GPS Provider"
- Press the "Connect" button

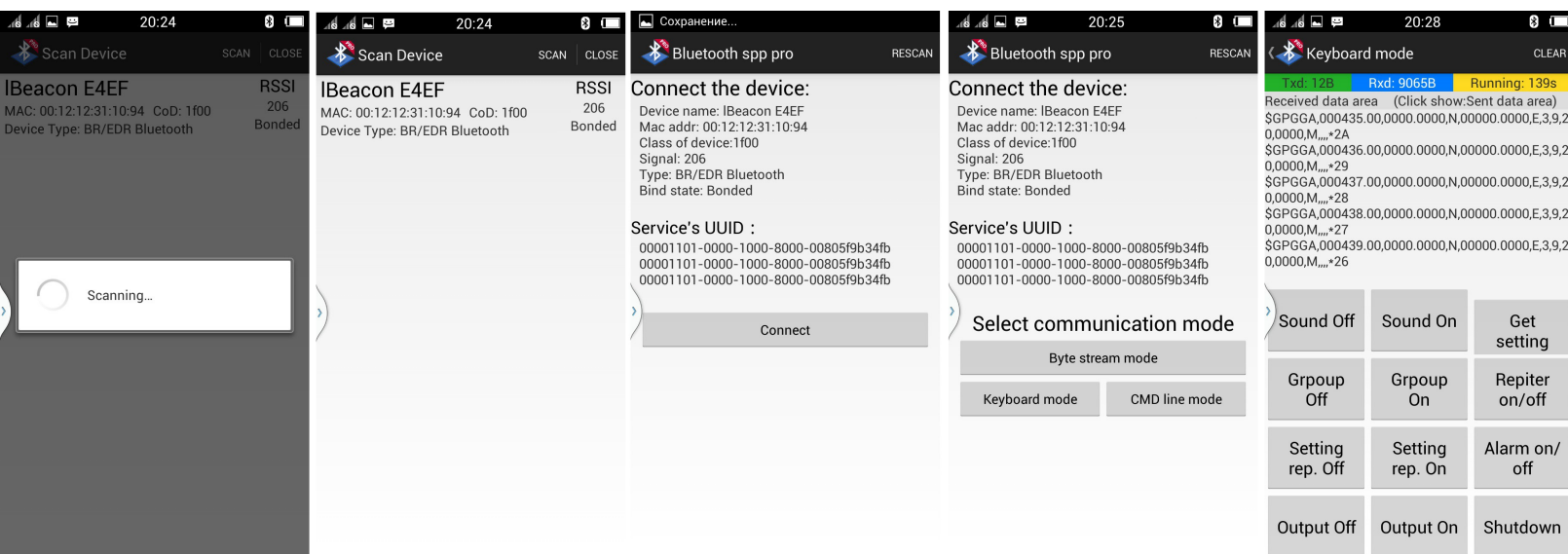
You will see that the button «CONNECT» became the button «STOP», in the window "Lat / Lon" dashes changed to the current or last known beacon GPS coordinates (or 00000, if the GPS receiver has never before been connected to the beacon).

Now you can write the coordinates to make it into another program navigation or start using the built-in card programs Bluetooth GPS, clicking on the tab "Map"



**Installing software Bluetooth SPP Pro for control searching device and change beacon properties.**

To change the configuration of the beacon (example, for turn on the repeater operation) and the signal strength viewing beacon group use the software “Bluetooth SPP Pro”. Download it from Google Play and install according to instructions. Run the program, it will automatically scan for available Bluetooth devices. Among the found devices, select your searching device IBeacon («HC-05" or «lBeacon-XXXX") and press «Connect» Click "Keyboard mode". If you have not done so before, now you can create yourself a virtual keyboard control functions IBeacon.



Each button is a keyboard will have its own name and control certain functions of the search appliance (when you send a command sequence of characters).

Editing buttons monotonous, the screenshots are the possible names of the buttons and the necessary data for them.

Enter in KEYBOARD mode.

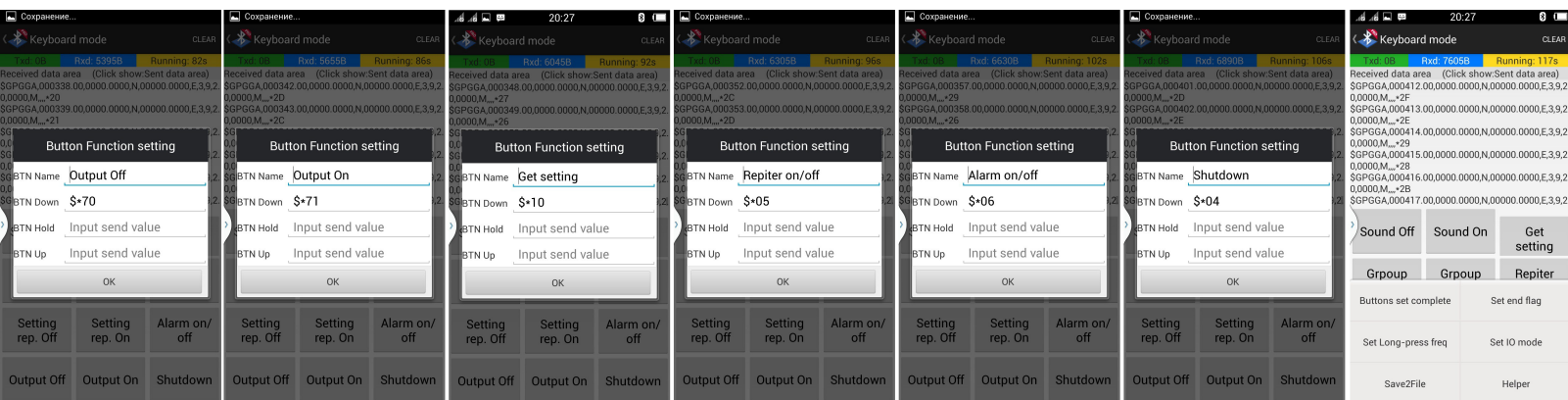
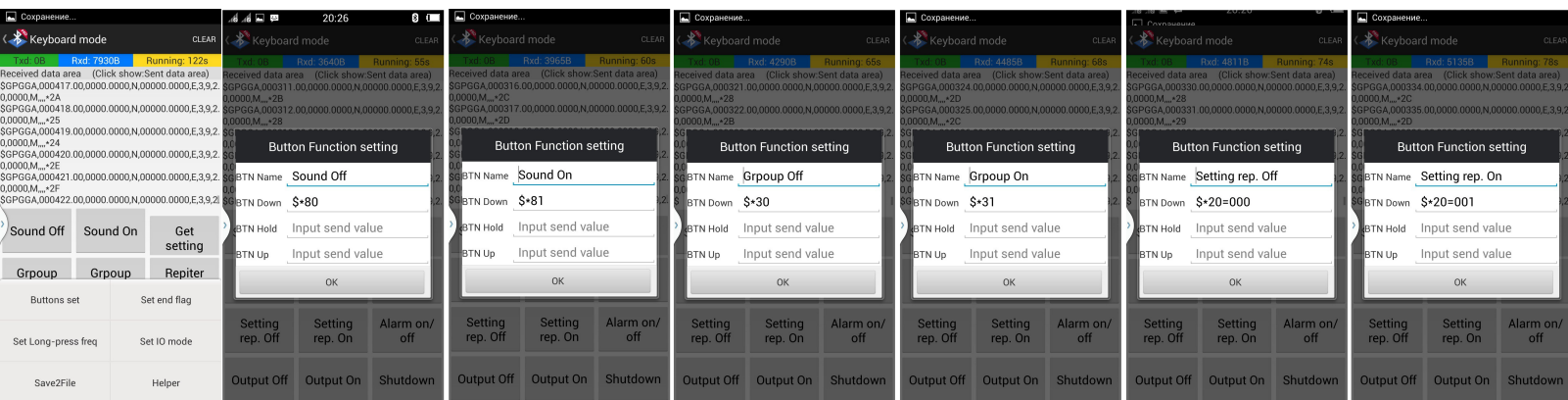
Press "Menu" (on the phone) -> in the table that appears, select "buttons set" (that allow you to edit buttons)

Press any button and enter the data in the form will be displayed as examples. Click "OK"

click the following button and enter the data from the other examples. Click OK

Program the other buttons on the list of commands

At the end of the edit buttons, press "Menu" (on the phone) -> "buttons set complete".



## Command for control searching device IBeacon.

Command format text, prefix \$\*, then two digits - the number of command. For the command "write configuration" \$\*2N= and five (required five!) digits - the parameters. Example \$01 , \$\*21=00001, \$\*04

Command working with the buttons on the search OR via Bluetooth

\$\*01 - go to the next beacon number in memory

\$\*02 - show GPS data (in “Beacon” mode) or reset the alarm (in “Alarm” mode)

\$\*04 - Power OFF

\$\*05 - Repeater On / Off

\$\*06 - Beacon / Alarm mode change

Commands that are available ONLY via Bluetooth:

- Read the settings of the beacon on the screen \$10\*

- Record setting beacon (before recording them must read!), \$\*2N=NNNNN, repeater on \$\*20=00001

repeater off \$\*20=00000

period of awakening beacon:

every 10 seconds \$\*22=00010,

every 3 seconds \$\*22=0003,

every 30 seconds \$\*22=00030, etc.

period "I am online" (in the Alarm mode)

30 seconds \$\*27=00030

5 seconds \$\*27=00005 etc. (See full list. "Properties beacon")

- Group

off \$\*30

on \$\*31

- Type data in Bluetooth,

text \$\*40

binary \$\*41 (for future GROUP software)

- Display text GPS data

\$\*70 to stop issuing

\$\*71 to resume

- Sound

off \$\*80

on \$\*81.

### **Set beacon property.**

Before you start changing the properties of the beacon you must read properties this via command \$\*10 (without this recording settings unavailable)

Beacon #M sn = NNNN, where M in the memory of the beacon number (0 to 4), and the serial number of the beacon NNNN 4 figures

Register 0 – Repeater N= 0, this beacon is not working repeater, 1-beacon works repeater

Register 1 - Min. RSSI for bind NNN = minimum received signal strength for bind

Register 2 - Wake\_up period NNN sec "= during regular waking up beacon, in seconds, from 1 to 128, default 10

Register 3 - Wake\_up in deep sleep NN min = in this version does not work

Register 4 - Time no sleep NNN sec (after last response) = time "waking" the beacon after taking extreme interrogation package, 1-255 seconds, default is 60.

Register 5 - Overload acc NN (in "ALARM" mode) = overload level for the alarm to protect 0-255, this version does not work

Register 6 - Duration overload NN (for future version) = duration of the overload alarm for protection, tenths of a second 0.1 - 25.5, this version does not work

Register 7 - Period I\_AM\_ONLINE NN sec (in "ALARM" mode) = time of send message "I ONLINE" in the "ALARM" mode, the default is 30 seconds

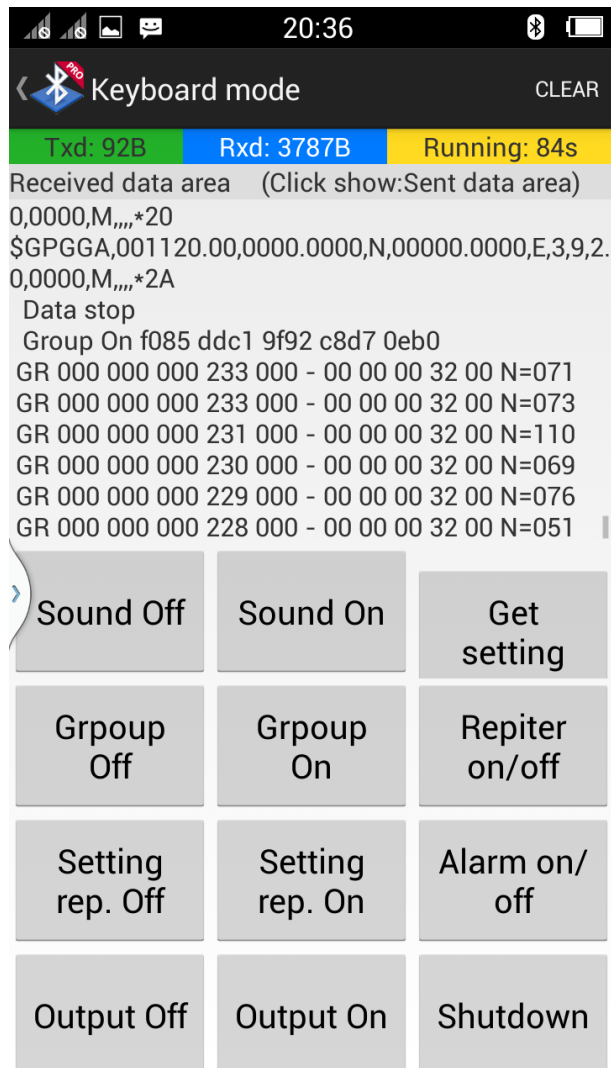
## Group beacons.

View the signal strength of the group of all stored in a searching device beacons possible after send via Bluetooth commands \$31\*.

After that, enter GROUP mode the searching device will issue on screen Android application (in software Bluetooth SPP) line of the text of the form containing 5 values received signal strength, 5 voltages beacons and level of noise at the receiver (in searching device).

Exit GROUP mode command \$ 30 \*

It will be released app for Android, where you can observe the position of up to 5 beacon on the area map.



## NMEA message.

After power on searcher device lBeacon seen any external gadget as a Bluetooth GPS receiver continuously every 1 second outstanding NMEA message \$ GPGGA, containing the geographical coordinates of the beacon. If the searcher and the beacon do not have a current or saved location, the latitude and longitude location will be 0. Note that the height and speed is not transmitted beacon on the search device and are always 0. The GPS time now starts counting from when the searcher power on.

Example NMEA messages that gives lBeacon:

